

We claim:

1. A fuel cell system comprising

a fuel cell unit; and

a membrane unit for separating a hydrogen-enriched fuel for the fuel cell unit from a hydrogen-containing mixture;

wherein said membrane unit comprises a semi-permeable membrane, and said semi-permeable membrane is permeable to molecular hydrogen.

2. The fuel cell system as defined in claim 1, wherein said semi-permeable membrane is a plastic membrane.

3. The fuel cell system as defined in claim 2, wherein said membrane unit has an operating temperature and said plastic membrane comprises a plastic material adjusted to said operating temperature

4. The fuel cell system as defined in claim 1, further comprising a reforming unit for converting a hydrocarbon fuel to said hydrogen-containing mixture and wherein said semi-permeable membrane is arranged between said reforming unit and said fuel cell unit.

5. The fuel cell system as defined in claim 4, wherein said hydrocarbon fuel is gasoline, diesel fuel, methane or methanol.
6. The fuel cell system as defined in claim 1, further comprising a reforming unit for converting a hydrocarbon fuel to said hydrogen-containing mixture and wherein said membrane unit is included within the reforming unit.
7. The fuel cell system as defined in claim 6, wherein said hydrocarbon fuel is gasoline, diesel fuel, methane or methanol.
8. The fuel cell system as defined in claim 1, further comprising a reforming unit for converting a hydrocarbon fuel to said hydrogen-containing mixture and wherein said membrane unit is at least included within said fuel cell unit.
9. The fuel cell system as defined in claim 8, wherein said hydrocarbon fuel is gasoline, diesel fuel, methane or methanol.
10. The fuel cell system as defined in claim 1, wherein said membrane unit comprises at least one control device for adjustment of a predetermined operation pressure in said membrane unit.

11. The fuel cell system as defined in claim 1, further comprising a feedback device for at least partial feed back of a hydrogen-containing partial stream from the fuel cell unit to an inlet to the fuel cell unit.

12. The fuel cell system as defined in claim 11, wherein the feedback device contains an additional membrane unit for hydrogen-enrichment of said hydrogen-containing partial stream and said additional membrane unit contains a molecular-hydrogen-permeable plastic membrane.